

[Outline of New Work Item Proposal]

Title: White light LED's for general lighting services

Scope: The standard specifying general characteristics, such as general construction, size and dimensions, with their tolerance, electrical characteristics, optical characteristics of white light LED's for general lighting services.

Justification of Proposals:

1. General

- LED is a light sources applyinlopment, uni-color LED's, orange and green light LED have been developed and in 1993, blue light LED was developed and put on sale. They have been widely ag the different energy converting process other than the conventional light sources, such as incandescent lamps, fluorescent lamps, HID lamps. Red color light LED using GaAs + LaF₃YbEr crystal was firstly developed and introduced on sale in 1969.
- In succession to this red light LED devepplied to indicators and sources of traffic signs.
- In Japan, total production amount of uni-color LED's has reached to about 8,000 million per a year. (Un light sources at 21st century, and in Japan, the new National Project: "Light of 21st Century" (High-efficient white light emitting chemical compound semiconductor) has been started in August, 1998, to develop high-efficient white light LED fit price : \8 / pc)
- Recently, in 1996, white light LED was developed and in 1997, it was put into market. Now total production amount in Japan becomes 2 million per a month. (Unit price : \100 / pc)
- White light LED's are expected as newor general lighting services.
- Essential items of this Japanese National Project are as follows:

LED Type 1 chip type (UV + Phosphor)
 (*: Chemical Compound Semiconductor)
*Luminous Efficacy (Target) 120 [lm / W]
*Period of Project 1998 _ 2002
*Present Members 15 Organizations

2. Recent States of white light LED

2.1.1 Materials and Luminous Efficacy

<u>Types Available</u>	<u>Material</u>	<u>lm / W</u>
1. 3 chips type	Blue + Green + Red	20
2. 1 chip type	Blue (InGaN) + Phosphor (YAG:Ce ³⁺)	15*
3. 1 chip type	UV(InGaN) + Phosphor (ZnS:Ag+(Zn,Cd):Cu,Al)	?
4. 1 chip type	Blue (GaN) + Sigle Crystal (ZnSe)	8

*: Commercially available value. 40 [lm / W] could be obtained as test samples.

2.1.2 Related Problems to be Improved

- (1) Improvement of quantum efficiency
- (2) Development of operating circuit for commercial electric power source
(100 V or 200 V)
- (3) Improvement of temperature dependency
- (4) Lamp life and lumen depreciation

3. General Principle

The standard shall include at least the following items, in order to assess and justify the need for this proposal.

- Scope
- Purpose and Justification
- Definitions
- LED Lamp Construction
- Size and Dimensions with tolerance
- Electrical Characteristics
 - * Initial Ratings of Lamp Current, Lamp Watt, Lamp Voltage, etc.
 - * Absolute Maximum Ratings of chips ---- Forwarded Current, Pulsed Forwarded Current, Reverse Voltage
 - * Variation of Electrical Characteristics during lamp life
- Optical Characteristics ---- Luminous Flux, Luminous Intensity, Spectral Distribution, Chromaticity Coordinates, Dominant Wavelength
- Method of Measuring Electrical Characteristics
- Method of Measuring Optical Characteristics

Proposer: Japanese National Committee of IEC TC34

Date: 28-10-1999

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